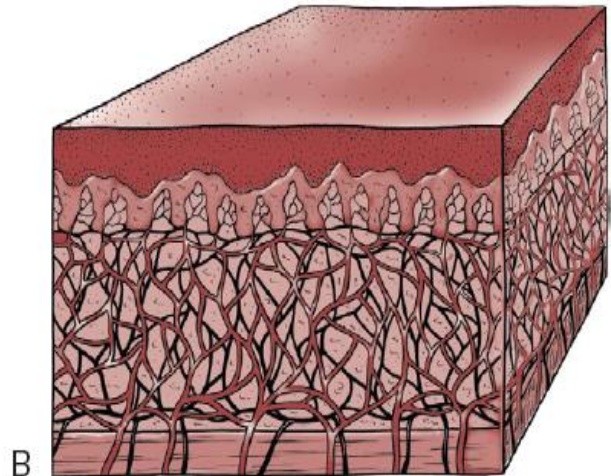
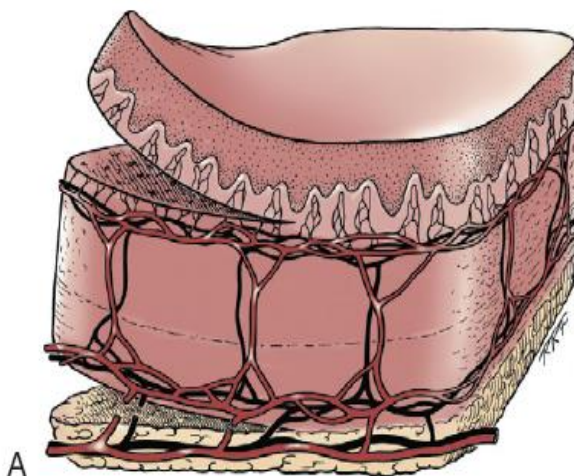
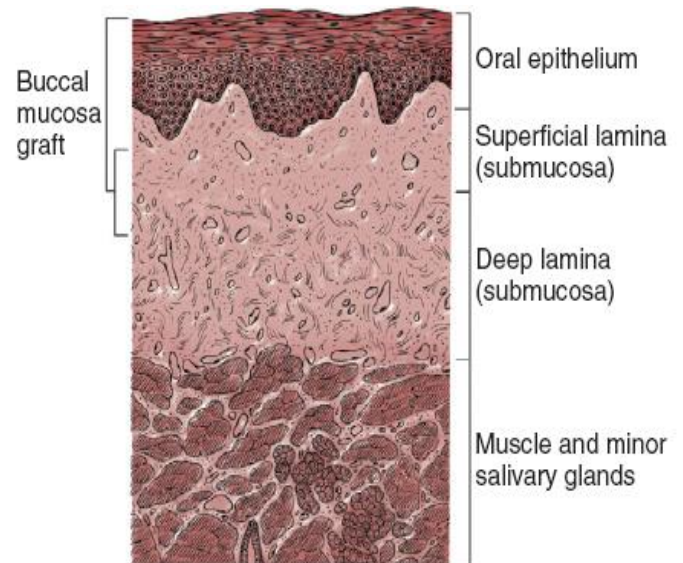
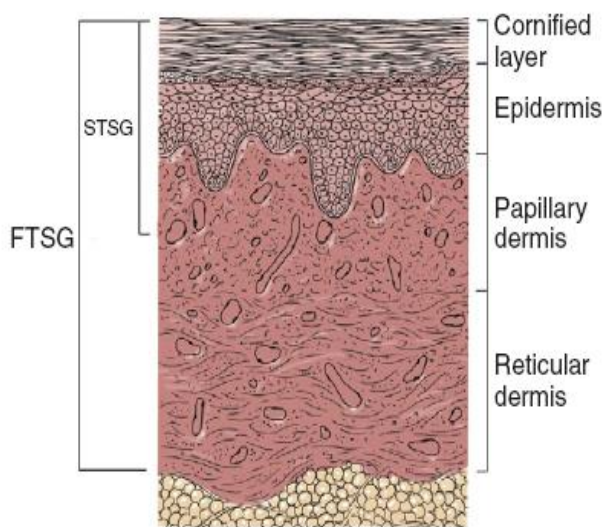


PRINCIPLES OF RECONSTRUCTIVE SURGERY

layers of the skin

- cornified layer
- epidermis (~1mm)
 - superficial plexus lies under epidermis (small and numerous vessels)
- dermis
 - adventitial dermis (superficial) } aka papillary dermis
 - contains LYMPHATICS
 - reticular dermis (deep) } subdermal plexus lies underneath reticular dermis



“graft”

- excised tissue that has been transferred to a graft host bed **WITHOUT blood supply** new blood supply to graft must develop by process called take. **requires ~96hrs**

There are 2 phases of “take”

1) imbibition (~48hrs)

- graft survives by “drinking” nutrients from graft host bed
- graft is colder than core body temp

2) inosculation (~48hrs)

- true micro-circulation is re-established in graft
- graft is same temp as core body temp
- affected by nature of graft tissue and conditions of graft host bed

different type of graft

- **STSG**
 - cornified layer + epidermis + part of papillary dermis
 - worse cosmesis, contracture rates, and sensation
 - better take
- **FTSG**
 - cornified layer + epidermis + entire dermis
 - better cosmesis, less contracture, better sensation
 - worse rate of survival and limited donor sites
 - **extra-genital FTSGs usually have very bad survival rates in GU reconstruction, EXCEPT posterior auricular FTSGs**
- **meshed graft**
 - mainly for STGS only
 - advantages
 - can expand graft
 - allows subgraft collections to escape
 - allows graft to conform better to irregular graft host beds (eg testes)
 - slightly better take

tissues are commonly used as a graft in GU reconstruction

- skin

- dartos fascia skin island flaps used for urethral reconstruction
- good for defects in tunica albuginea of corpora cavernosa
- takes well

- bladder mucosa

- epithelium + lamina propria
- good vascular characteristics (more perforators)
- **hypertrophic growth and dessication limits use in distal urethra**

- buccal mucosa

- epithelium + lamina propria
- **optimal vascular characteristics with “wet” epithelial surface**
- good results for urethra

- posterior auricular FTSG (Wolff graft)

- **good vascular characteristics**

- tunica vaginalis

- essentially peritoneum
- poor results for urethra and good for only small defects of tunica albuginea in the corpora cavernosa
- get aneurysmal dilation if used for larger defects

- vascular graft

- not true graft
- survives by endothelial direct perfusion and re-establishment of vein wall blood flow by perfusion of vasa vasorum
- used for defects in tunica albuginea

- rectal mucosa

- **proposed for urethra but no good literature**

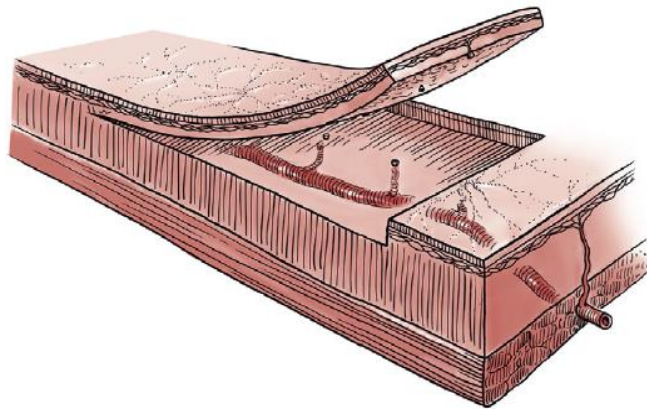
“flap”

- excised tissue that is transferred **WITH blood supply** either preserved or surgically re-established

They are classified based on vascular supply

- **random flap**

- no defined cuticular vascular territory
- survival depends on intradermal or subdermal plexuses



- **axial flap**

- defined vessel in base of flap
- 3 main types include:

- a) direct cuticular

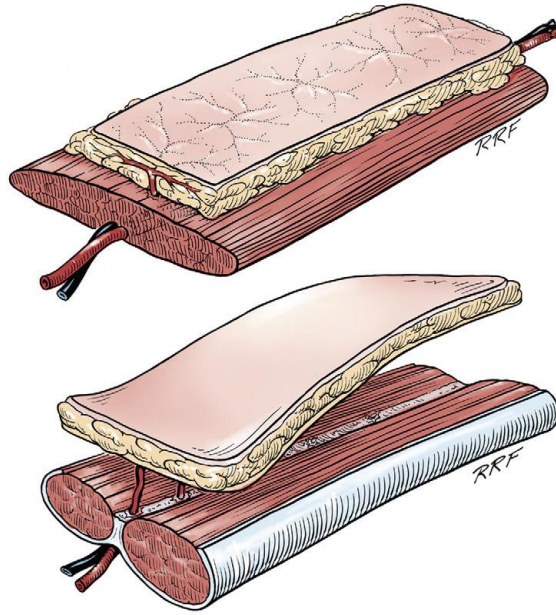
based on vessel superficial to superficial layer of deep body wall fascia eg groin flap

- b) musculocutaneous

based on vascularity to muscle , overlying skin based on perforators eg gracilis flap

- c) fasciocutaneous

based on vascularity to fascia , overlying skin based on perforators eg penile dartos fascia flap

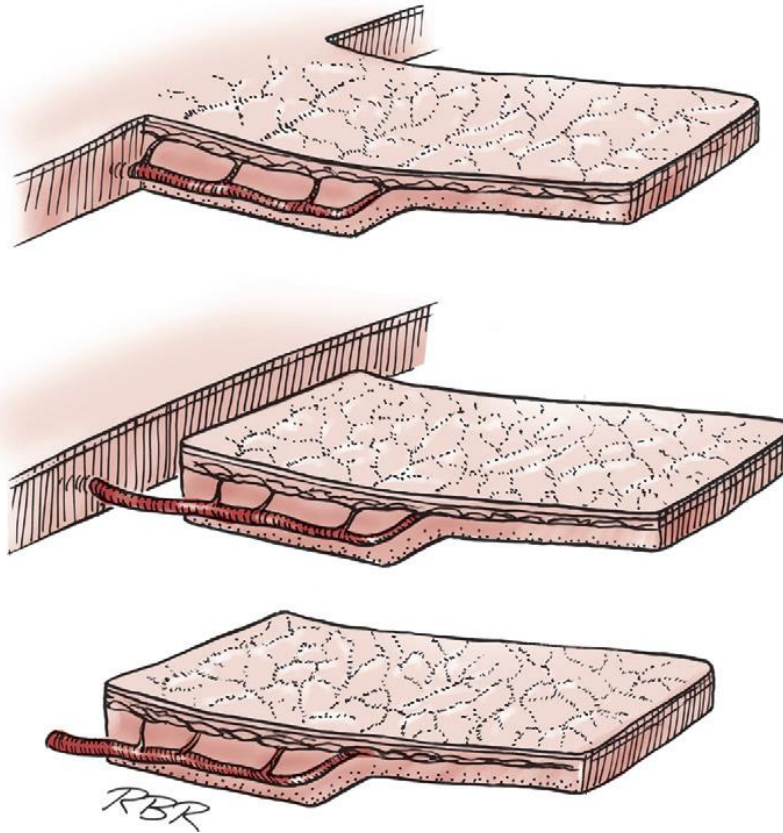


A, Musculocutaneous flap. Musculocutaneous perforators from the artery to a muscle vascularize the skin and overlying subcutaneous fat. They may be transferred as free flaps but are usually transferred locally, left attached to the vascular pedicle.

B, Fasciocutaneous flap. Perforating blood vessels from rich plexuses on the superficial and deep aspects of the fascia connect to perforator vessels that communicate with the microvasculature of the overlying paddle. In genital reconstruction, these flaps are based on the dartos fascia of the penis or are free flaps from the forearm.

it also classified based on elevation technique

- peninsular flap
 - vascular and cutaneous continuity of flap base left intact
- island flap
 - only vascular continuity of flap base maintained
- microvascular “free flap”
 - vascular and cuticular continuity interrupted
 - needs microvascular re-establishment at recipient site



A, Peninsula flap. The vascular continuity and the cutaneous continuity in the flap base are intact.

B, Island flap. The vascular pedicle is intact; the cuticular continuity has been divided. These axial vessels are unsupported (dangling).

C, Microvascular free-transfer flap. The free-flap cuticular and vascular connections are interrupted at the base of the flap. Vascular continuity is reconstituted in the recipient area by a microsurgical anastomosis